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**United States Patent** [19][11] **Patent Number:** **5,559,875****Bieselin et al.**[45] **Date of Patent:** **Sep. 24, 1996****[54] METHOD AND APPARATUS FOR RECORDING AND RETRIEVAL OF AUDIO CONFERENCES**

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**[51] Int. Cl.<sup>6</sup>** ..... H04M 3/56; H04M 3/50

**[52] U.S. Cl.** ..... 379/202; 379/67; 379/88; 379/93; 379/96

**[58] Field of Search** ..... 379/202, 201, 379/203, 204, 205, 67, 88, 89, 93, 96, 68; 348/13, 14, 15; 370/62, 110.1

**[56] References Cited****U.S. PATENT DOCUMENTS**

4,455,455	6/1984	Little	379/203
4,640,991	2/1987	Matthews et al.	379/88
4,656,625	4/1987	Nojiri et al.	370/62
4,691,347	9/1987	Stanley et al.	379/203
4,796,293	1/1989	Blinken et al.	379/202
4,805,205	2/1989	Faye	379/96
4,965,819	10/1990	Kannes	379/53
4,975,902	12/1990	Damany	370/62
5,012,509	4/1991	Nakamura et al.	379/53
5,056,136	10/1991	Smith	380/10
5,099,510	3/1992	Blinken, Jr. et al.	379/202
5,257,306	10/1993	Watanabe	379/53
5,323,314	6/1994	Baber et al.	364/401
5,323,445	6/1994	Nakatsuka	348/15
5,341,374	8/1994	Lewen et al.	379/202
5,373,549	12/1994	Bales et al.	379/93
5,382,972	1/1995	Kannes	348/15
5,384,772	1/1995	Marshall	370/60

5,408,470	4/1995	Rothrock et al.	370/62
5,434,910	7/1995	Johnson et al.	379/89
5,434,913	7/1995	Tung et al.	379/202
5,440,624	8/1995	Schoof, II	379/202
5,450,481	9/1995	Penzias	379/202
5,452,299	9/1995	Thessin et al.	379/202
5,452,348	9/1995	Adams et al.	379/202
5,475,747	12/1995	Bales et al.	379/202

**FOREIGN PATENT DOCUMENTS**

374943A	6/1990	European Pat. Off.	H04M 3/56
580397A2	1/1994	European Pat. Off.	H04M 3/56
63-261948	10/1988	Japan	H04M 3/56
1-32751	2/1989	Japan	H04M 9/00
6-98029	4/1994	Japan	H04M 3/56
6-177987	6/1994	Japan	H04M 3/56

**OTHER PUBLICATIONS**

IBM Technical Disclosure Bulletin, "Computer-Mediated Communication System Using Both Telephone And Computer Networks", vol. 30, No. 6, Nov. 1987, pp. 317,318.

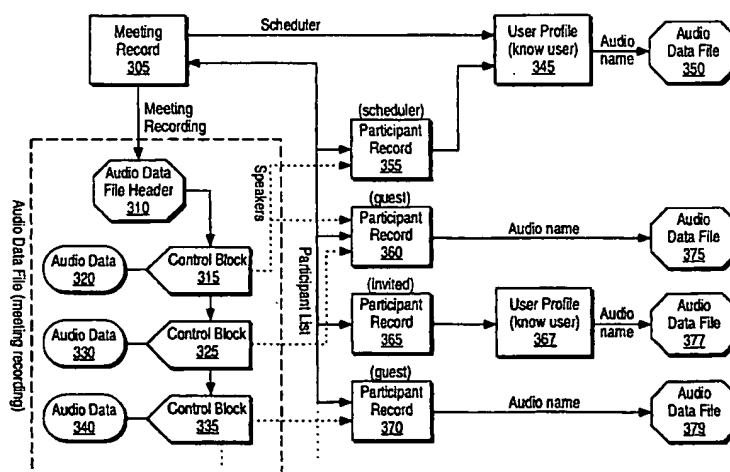
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**[57] ABSTRACT**

An innovative recording and playback system to record and play back audio conferences. In one embodiment, the audio recorded during the conference is digitized and placed in blocks of a determined size. These blocks are stored on a computer storage medium such as a disk drive. A data structure is maintained consisting of an identification of the number and location of the voice blocks. Also provided in the data structure is the identification and location of blocks of data corresponding to the conference participants as well as the identification of other information associated with the conference. When the conference is to be played back by the user, the data structure and corresponding blocks are accessed to play back the conference as well as selectively provide the additional information, for example, the spoken names of the conference participants, to the user.

**22 Claims, 28 Drawing Sheets**

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DOCUMENT-IDENTIFIER: US 5559875 A

TITLE: Method and apparatus for recording and  
retrieval of  
audio conferences

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Detailed Description Text - DETX (13):

The meeting record 220 further identifies the participants to the conference, and provides a vector to the participant records 225 for the recorded conference. The participant record 225 provides a user index 226 to the user profile record 230 for each registered participant, and in addition, provides the pointer to the audio data file header record that is associated with the audio data blocks that contain the voice data of the spoken name of the identified participant. The spoken name of the participant is used to generate audio announcements of the entry, departure and speakers during the recorded conference.

Detailed Description Text - DETX (16):

Similarly, from the meeting record 305, the system can access the identification of the scheduler by accessing the user profile 345. From the user profile record 345, the spoken name of the scheduler is retrieved from its audio data file 350 and is played back to the user in audible form. In addition, from the user profile record 345, the corresponding meeting records 305 of conferences the user is an identified participant of, are identified, enabling, for example, the generation of a conference list

that the user can attend.

Detailed Description Text - DETX (24):

During the conference, the user can perform certain actions, step 577, to generate information associated with the audio recording of the conference. For example, conference participants who are speaking during a particular audio data block can be identified and added to the speaker list in the current audio data file control block, step 578. When a conference participant speaks, the system detects that a participant has spoken, identifies the source of the speech. This can be achieved a number of ways using technology well known in the art. For example, circuitry can be used to determine voice signals on a particular line card interface; the system can therefore identify the conference participant by the line card or input/output port the conference participant is coupled to. Alternately, speech processing which uses a conference participant's voice print to identify the conference participant speaking may be employed.

Claims Text - CLTX (6):

4. The apparatus as set forth in claim 1, wherein the audio data file control block further comprises a speakers field that identifies conference participants who are speaking during a portion of the conference recorded in the corresponding audio data block.

Claims Text - CLTX (15):

13. The apparatus as set forth in claim 1, wherein the audio data file control block further comprises an entries field that identifies conference participants that join the conference during a portion of the

conference  
recorded in the corresponding audio data block.

Claims Text - CLTX (17):

15. The apparatus as set forth in claim 1, wherein the audio data file control block further comprises a departure field that identifies conference participants that leave the conference during a portion of the conference recorded in the corresponding audio data block.

Claims Text - CLTX (46):

(k) if a user playing back a recorded conference indicates that the conference participants are to be identified, reading audio data file control blocks corresponding to each audio data block representative of the spoken name of each conference participant, said audio data file control blocks pointed to by pointers in the meeting record, retrieving the corresponding audio data blocks and playing back the voice data stored in the audio data blocks as audio to generate the spoken name of each conference participant.

Current US Original Classification - CCOR (1):  
379/202.01